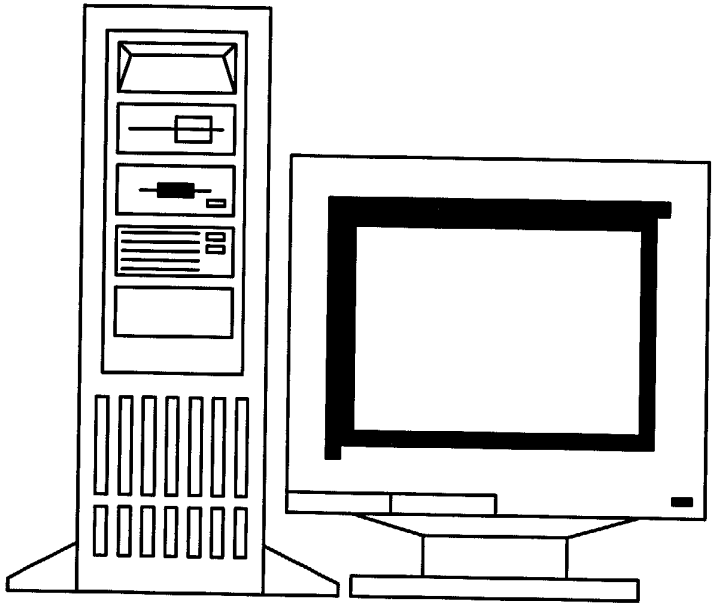

Computer System
102

Figure 1

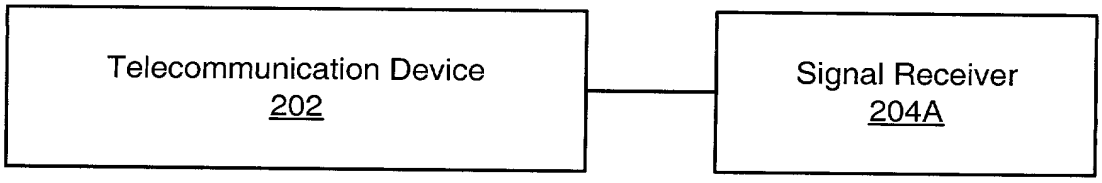

Figure 2A

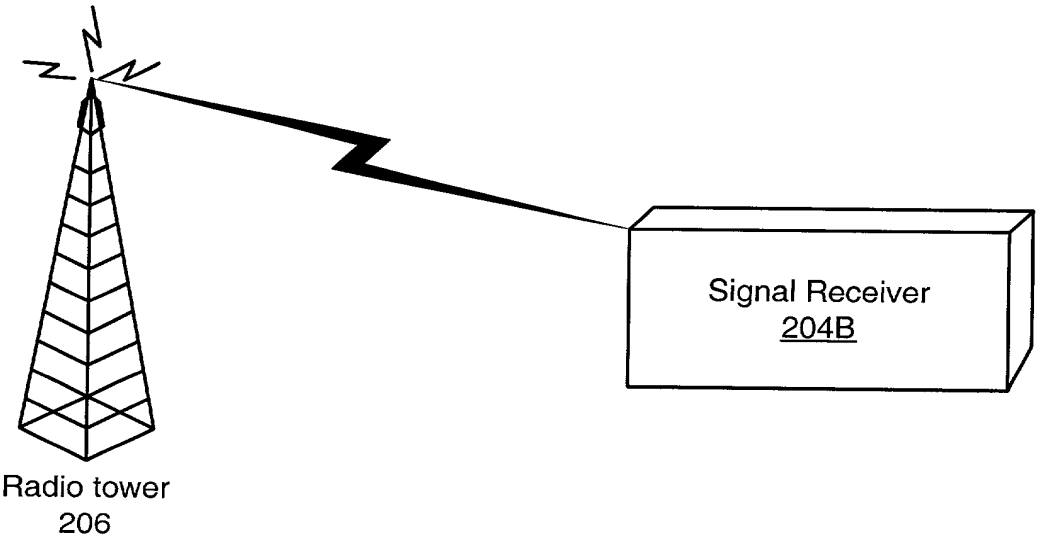

Figure 2B

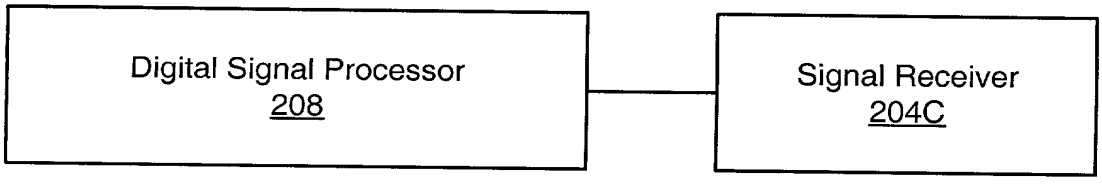

Figure 2C

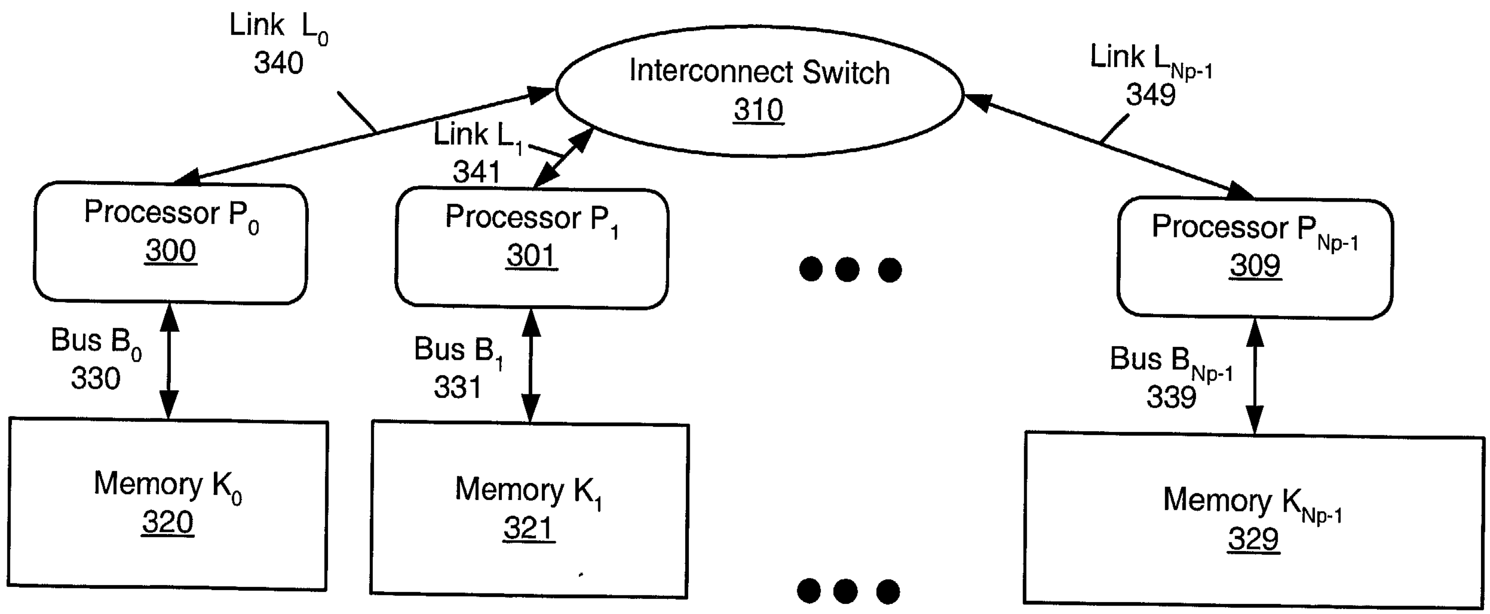
Link L_0
340
Interconnect Switch
310
Link L_{Np-1}
349
Link L_1
341
Processor P_0
300
Processor P_1
301
Processor P_{Np-1}
309
Bus B_0
330
Bus B_1
331
Bus B_{Np-1}
339
Memory K_0
320
Memory K_1
321
Memory K_{Np-1}
329

Figure 3

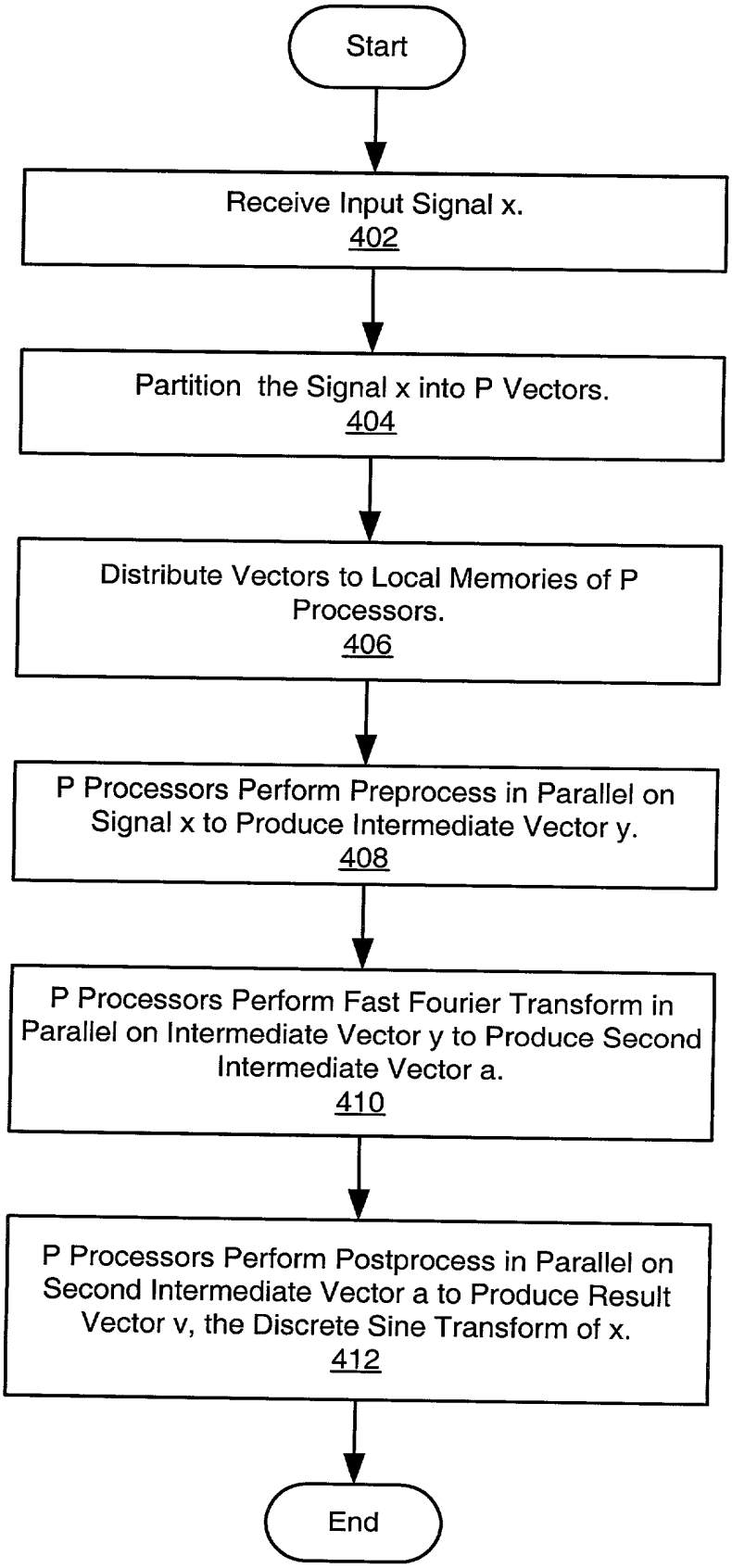
Start
Receive Input Signal x.
402
Partition the Signal x into P Vectors.
404
Distribute Vectors to Local Memories of P Processors.
406
P Processors Perform Preprocess in Parallel on Signal x to Produce Intermediate Vector y.
408
P Processors Perform Fast Fourier Transform in Parallel on Intermediate Vector y to Produce Second Intermediate Vector a.
410
P Processors Perform Postprocess in Parallel on Second Intermediate Vector a to Produce Result Vector v, the Discrete Sine Transform of x.
412
End

Figure 4A

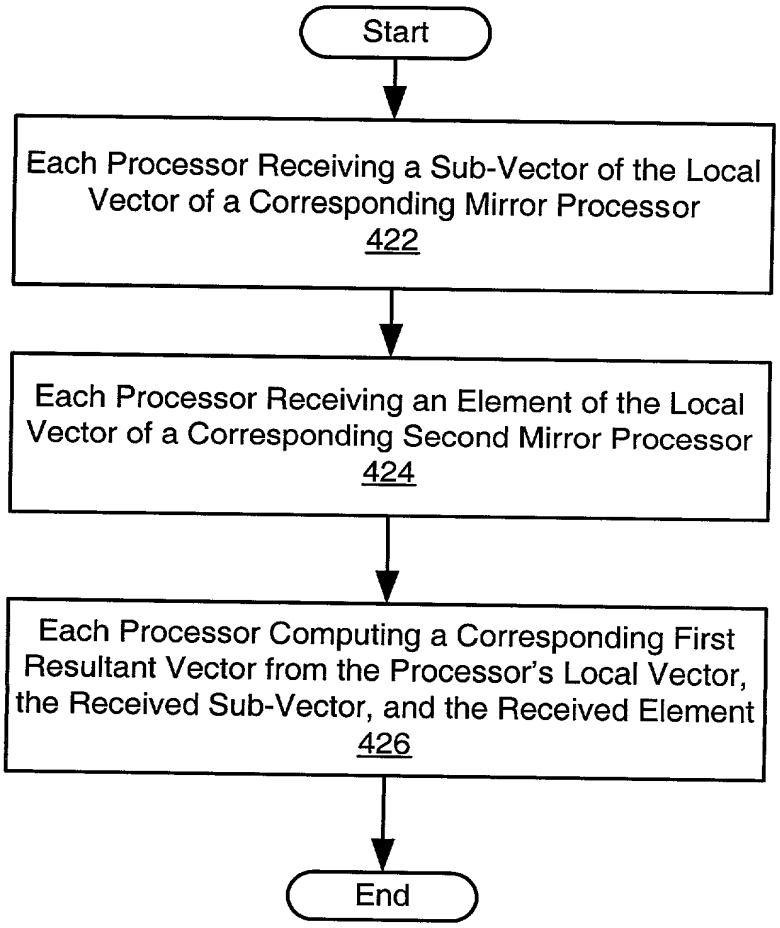
Start
Each Processor Receiving a Sub-Vector of the Local Vector of a Corresponding Mirror Processor
422
Each Processor Receiving an Element of the Local Vector of a Corresponding Second Mirror Processor
424
Each Processor Computing a Corresponding First Resultant Vector from the Processor's Local Vector, the Received Sub-Vector, and the Received Element
426
End

Figure 4B

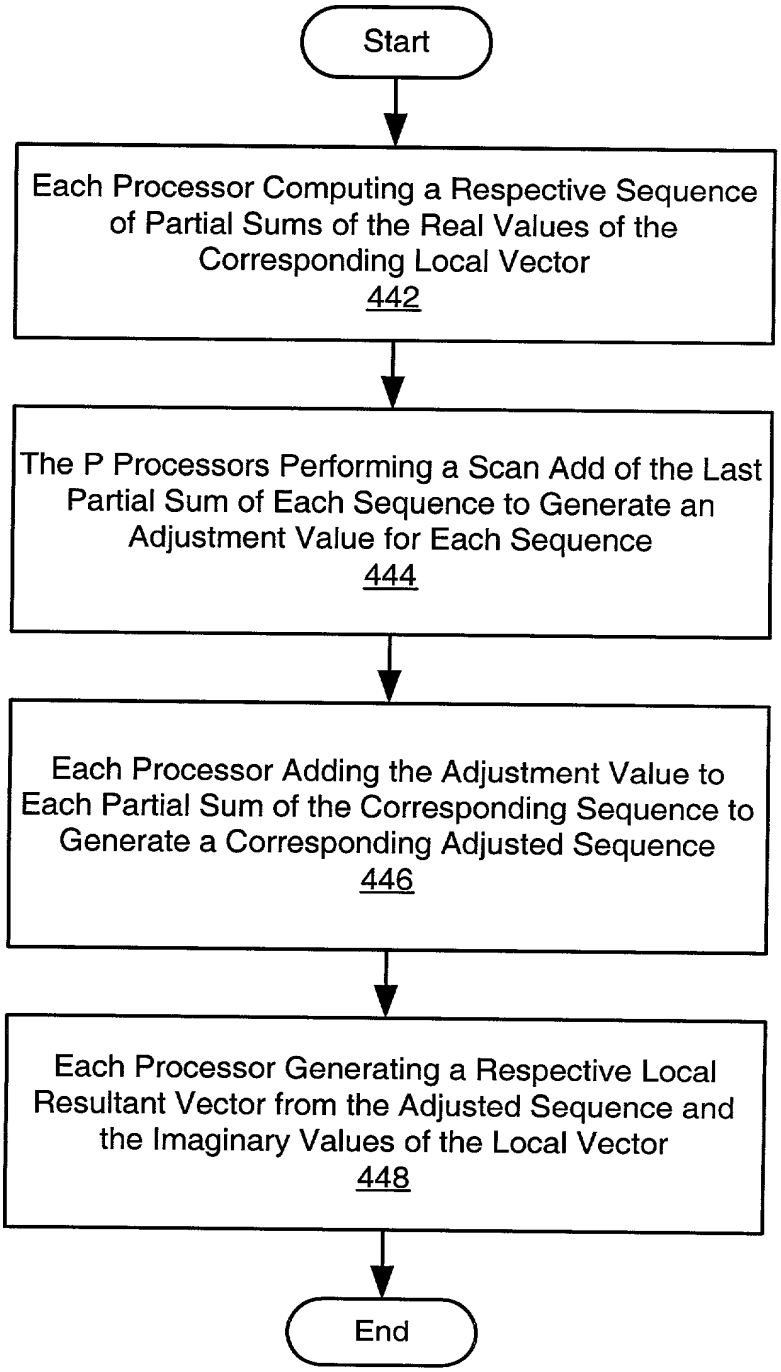
Start
Each Processor Computing a Respective Sequence of Partial Sums of the Real Values of the Corresponding Local Vector
442
The P Processors Performing a Scan Add of the Last Partial Sum of Each Sequence to Generate an Adjustment Value for Each Sequence
444
Each Processor Adding the Adjustment Value to Each Partial Sum of the Corresponding Sequence to Generate a Corresponding Adjusted Sequence
446
Each Processor Generating a Respective Local Resultant Vector from the Adjusted Sequence and the Imaginary Values of the Local Vector
448
End

Figure 4C

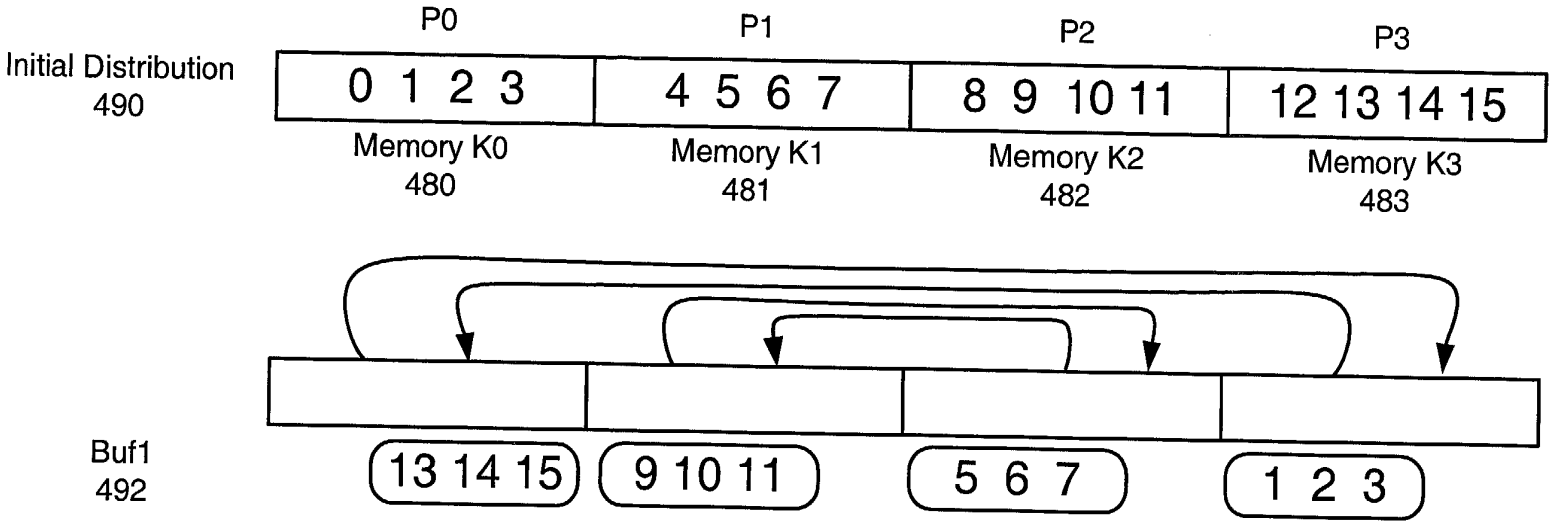

Figure 5A

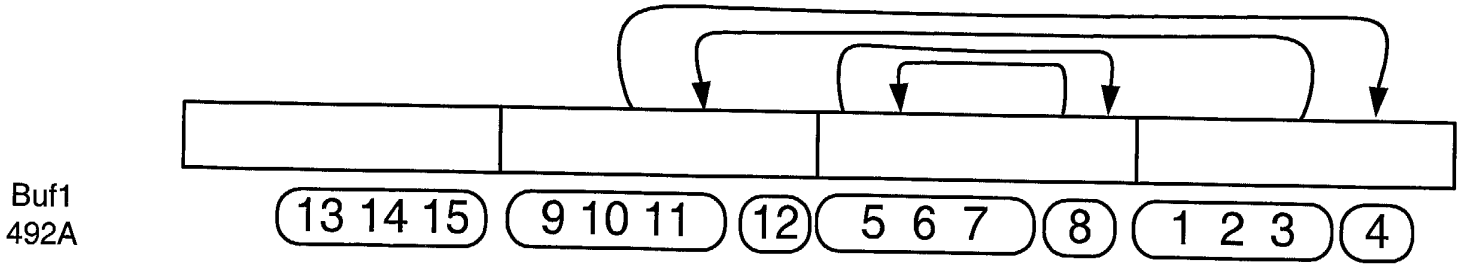

Figure 5B

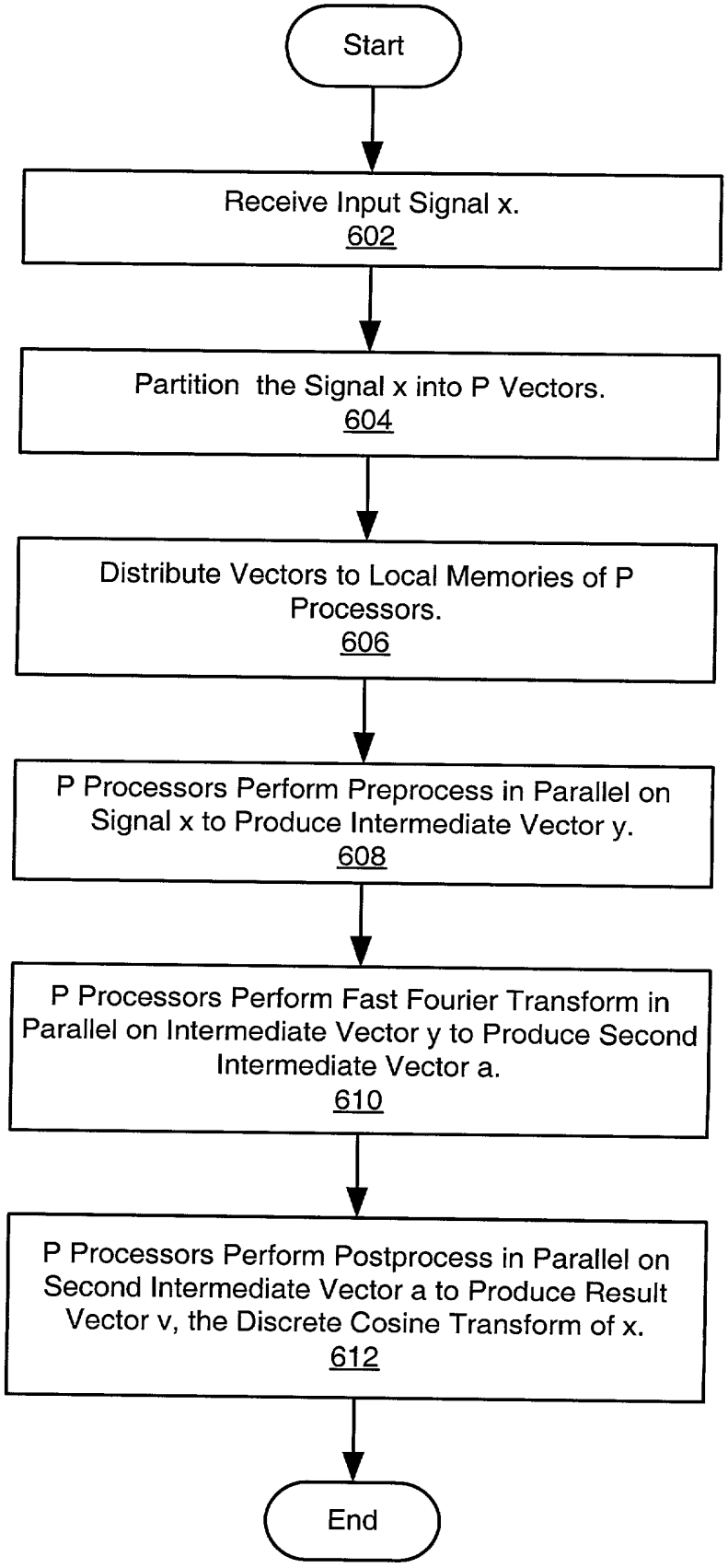
Start
Receive Input Signal x.
602
Partition the Signal x into P Vectors.
604
Distribute Vectors to Local Memories of P Processors.
606
P Processors Perform Preprocess in Parallel on Signal x to Produce Intermediate Vector y.
608
P Processors Perform Fast Fourier Transform in Parallel on Intermediate Vector y to Produce Second Intermediate Vector a.
610
P Processors Perform Postprocess in Parallel on Second Intermediate Vector a to Produce Result Vector v, the Discrete Cosine Transform of x.
612
End

Figure 6A

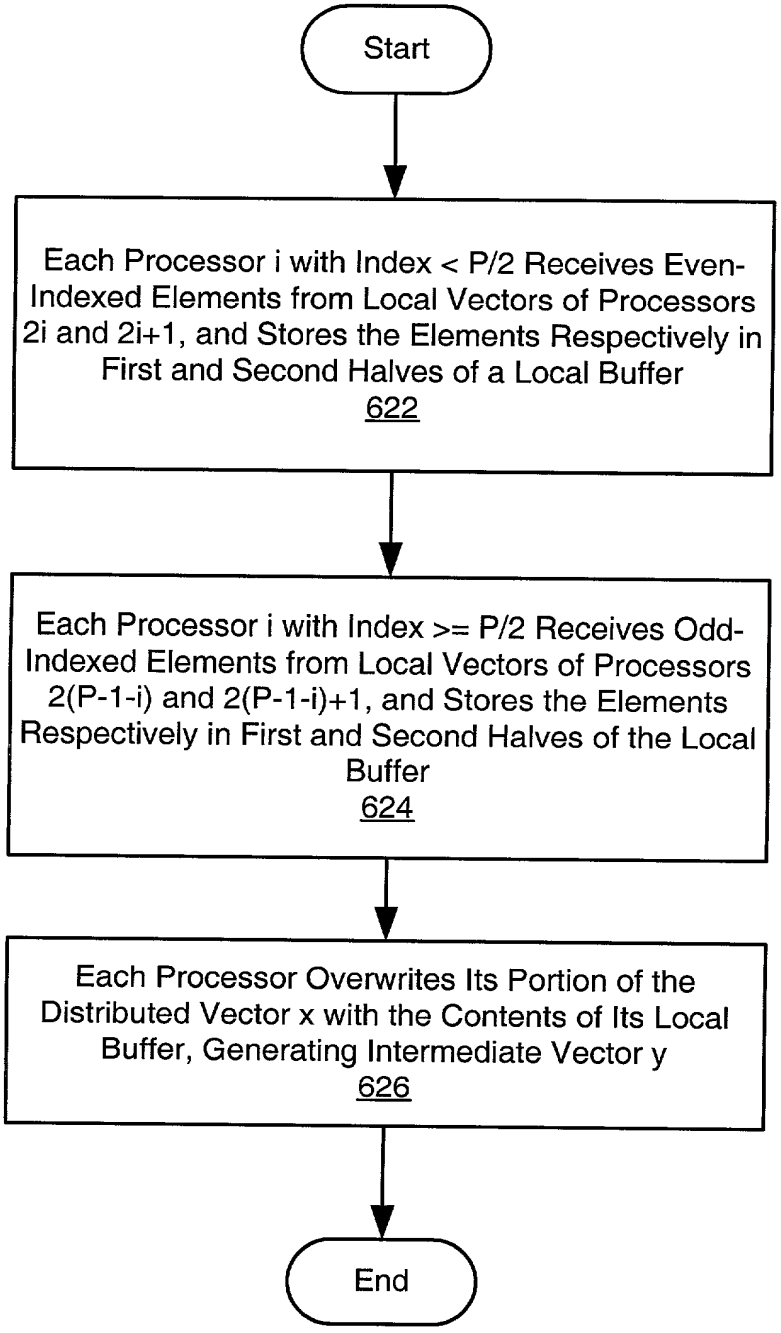
Start
Each Processor i with Index < P/2 Receives Even-Indexed Elements from Local Vectors of Processors 2i and 2i+1, and Stores the Elements Respectively in First and Second Halves of a Local Buffer
622
Each Processor i with Index >= P/2 Receives Odd-Indexed Elements from Local Vectors of Processors 2(P-1-i) and 2(P-1-i)+1, and Stores the Elements Respectively in First and Second Halves of the Local Buffer
624
Each Processor Overwrites Its Portion of the Distributed Vector x with the Contents of Its Local Buffer, Generating Intermediate Vector y
626
End

Figure 6B

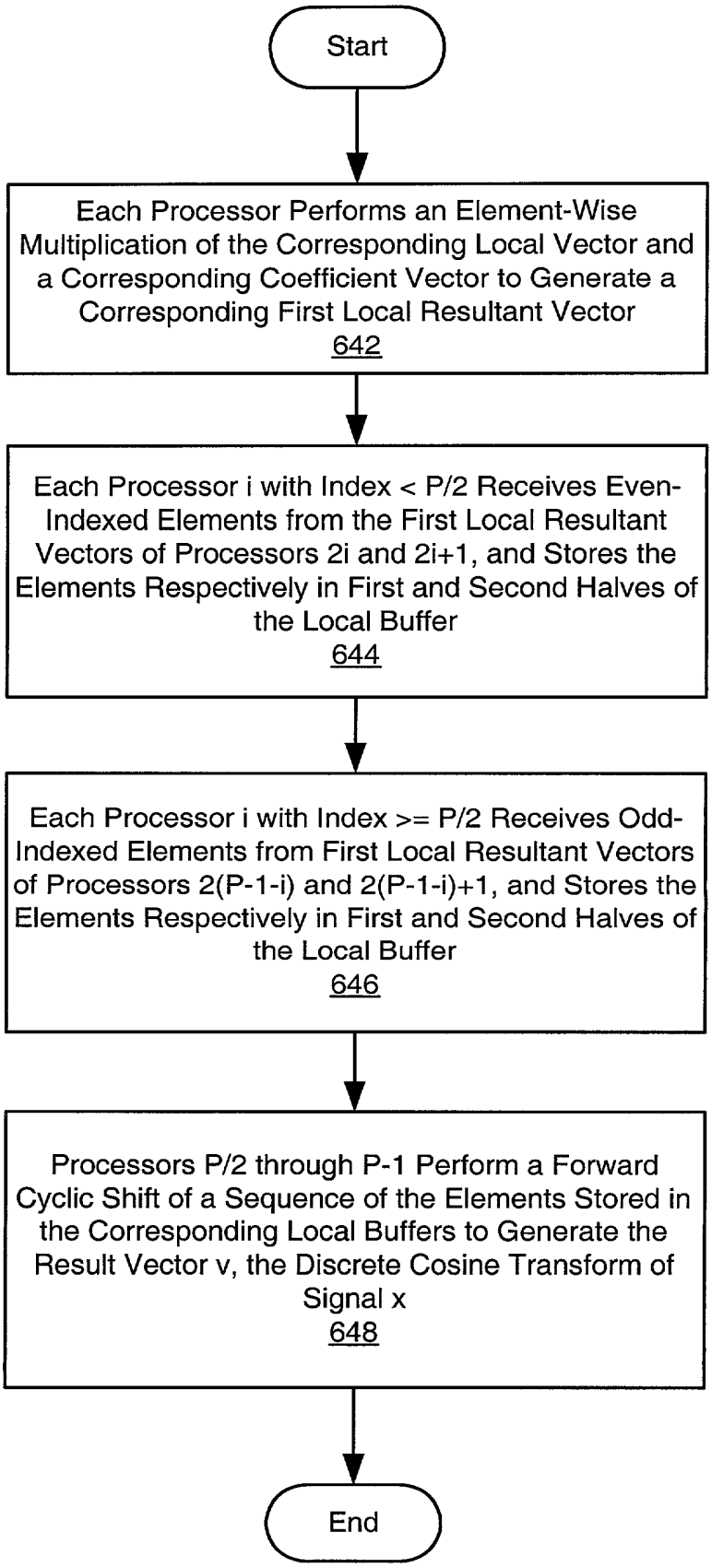
Start
Each Processor Performs an Element-Wise Multiplication of the Corresponding Local Vector and a Corresponding Coefficient Vector to Generate a Corresponding First Local Resultant Vector
642
Each Processor i with Index < P/2 Receives Even-Indexed Elements from the First Local Resultant Vectors of Processors 2i and 2i+1, and Stores the Elements Respectively in First and Second Halves of the Local Buffer
644
Each Processor i with Index >= P/2 Receives Odd-Indexed Elements from First Local Resultant Vectors of Processors 2(P-1-i) and 2(P-1-i)+1, and Stores the Elements Respectively in First and Second Halves of the Local Buffer
646
Processors P/2 through P-1 Perform a Forward Cyclic Shift of a Sequence of the Elements Stored in the Corresponding Local Buffers to Generate the Result Vector v, the Discrete Cosine Transform of Signal x
648
End

Figure 6C